

SIEMENS

MULTIMOBIL 2.5

SP

Maintenance Instructions

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Version: 6.0

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INDEX

8	MAINTENANCE INSTRUCTIONS	8-3
8.1	GENERAL.....	8-3
8.2	REPLACING DAMAGED OR MISSING SCREWS.....	8-3
8.3	CLEANING	8-3
8.4	PRODUCT DISPOSAL.....	8-4
8.4.1	<i>Radioprotection Material.....</i>	<i>8-4</i>
8.4.2	<i>Transformer Oil.....</i>	<i>8-4</i>
8.4.3	<i>Plastics.....</i>	<i>8-4</i>
8.4.4	<i>Electrolytic Capacitors</i>	<i>8-4</i>
8.5	MECHANICAL RISK.....	8-4
8.6	SAFETY CHECKS.....	8-5
8.6.1	<i>Daily checks.....</i>	<i>8-5</i>
8.6.2	<i>Monthly checks.....</i>	<i>8-5</i>
8.7	PERFORMANCE CHECK (EVERY SIX MONTHS).....	8-5
8.8	ALIGNING THE LIGHT FIELD TO THE RADIATION FIELD	8-6
8.8.1	<i>Operating Sequence.....</i>	<i>8-6</i>
8.8.2	<i>Adjustment and Evaluation.....</i>	<i>8-6</i>
8.9	CHECKING AND READJUSTING THE COUNTERWEIGHT.....	8-7
8.9.1	<i>Movements.....</i>	<i>8-7</i>
8.9.2	<i>Adjustment Instructions</i>	<i>8-7</i>
8.10	REMOVING THE TOP PANEL , FRONT COVER AND X-RAY SOURCE ASSEMBLY	8-8
8.10.1	<i>Removing the top panel</i>	<i>8-8</i>
8.10.2	<i>Removing the Front cover.</i>	<i>8-9</i>
8.10.3	<i>Removing the X-ray source assembly.</i>	<i>8-9</i>
8.11	REPLACING THE SINGLE TANK.....	8-10
8.12	REPLACING THE COLLIMATOR.....	8-10
8.13	REPLACING THE COLLIMATOR LAMP.....	8-11

8 Maintenance Instructions

8.1 General

All parts, modules of this product must be tested, inspected, for performance and safety aspects every 12 months to ensure that the product functions properly and is safe for patients, operating personnel and other persons.

Every 12 months, trained technical personnel should inspect and if necessary replace system components of the generator which may produce hazardous conditions due to excessive wear and tear. These instructions should be included in the annual maintenance performed by Siemens Customer Service.

If more frequent inspections and maintenance are required by federal or local regulations, ensure compliance with them.

8.2 Replacing damaged or missing screws

Before working on the open MULTIMOBIL 2.5 switch off the unit with the power switch on the control panel and unplug the power cable.

Before inserting or removing PC boards, observe the ESD regulations.

Damaged or missing screws should only be replaced by steel screws having the specified tensile strength with Nickel Plating (6492) specified in the Surface Finish Documents.

8.3 Cleaning

The unit must always be switched OFF or disconnected before cleaning.

Use only water or a luke warm mixture of a household cleaner diluted with water to clean the unit .

Do not use an abrasive or organic solvents or cleaning agents containing solvents such as gasoline used for cleaning purposes, alcohol or stain remover . Do not spray water on the unit.

CAUTION	Switch OFF the system prior to cleaning,disinfecting, or sterilizing
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Clean the unit with a damp cloth or cotton pad.

Dampen the cloth or pad with water or lukewarm, diluted commercially available liquid cleaning solution.

CAUTION

Do not use scouring powder, organic solvents (may damage materials) or solvent based cleaning fluids (benzene, alcohol, spot remove). As is commonly known, the ingredients in disinfectants are hazardous to your health. Ensure that room is well ventilated when using any disinfectant. Follow the instructions for using disinfectants.

Do not spray the unit. The cleaning fluid must not seep into the generator. Substituted phenol based or chlorine releasing disinfectant can weaken materials and are not recommended. The same restrictions apply to undiluted solutions with a high alcohol content (e.g. for disinfecting hands). Disinfectant sprays should generally not be used, the spray can seep into the system, and safety features can no longer be guaranteed (possible damage to electrical components, formation of flammable mixtures of air and the solution vapour).

To disinfect surfaces, we recommend common liquid solutions of aldehyde-based or ampholytic surfactant -based disinfectant.

8.4 Product Disposal

Legal regulations may contain special prescriptions concerning the disposal of this product. In order to avoid environmental damage and/or personal injury, please inform SIEMENS Customer Service if you want to put the unit out of operation and dispose it.

8.4.1 Radioprotection Material

Lead in X-ray tube assembly and in Collimator 1.65 kg.

8.4.2 Transformer Oil

Oil in X-ray tube assembly, approx. 3.2 kg.

8.4.3 Plastics

Epoxy resin on PC boards, PVC of cables approx. 5 kg.

8.4.4 Electrolytic Capacitors

These capacitors must be emptied. Please inform the Siemens Customer Service.

Capacitors approx. 1.5 kg.

Electrolytic Capacitors approx. 5.5 kg.

8.5 Mechanical Risk

The tension in the spring unit must be relieved. Please inform Siemens Customer service.

8.6 Safety Checks

The user shall follow the following safety checks

8.6.1 Daily checks

Check the power cord. Do not use the unit if the power cord is damaged.

Check the exposure indicator and audible signal during exposure.

Check the locking mechanism for the support arm.

Check that the Single tank assembly and the arm system remain in the desired position.

8.6.2 Monthly checks

Check the lifting and lowering movements of the support arm.

Check function of locking lever and cap screw on the X-ray tube.

Check the legibility of the labels according to those in section *Location of Labels*.

If any label requires to be replaced, please notify Siemens customer service.

8.7 Performance Check (Every Six months)

Check Counterbalancing of the support arm at each position.

Check the locking mechanism for the support arm.

Check Brake for proper functioning.

Take a sample exposure at 60 kV, 10 mAs.

Check for Radiation indication LED and the Audio indication in form of Buzzer.

NOTICE

Annual Maintenance must be performed as per the guidelines described in the Maintenance section.

8.8 Aligning the light field to the radiation field

8.8.1 Operating Sequence

Load a 24 Cm x 30 cm or 10" x 12 " cassette with film and place it on a table or base.

Using a tape measure, set a vertical SID of 100cm or 40" to the upper edge of the cassette as shown.

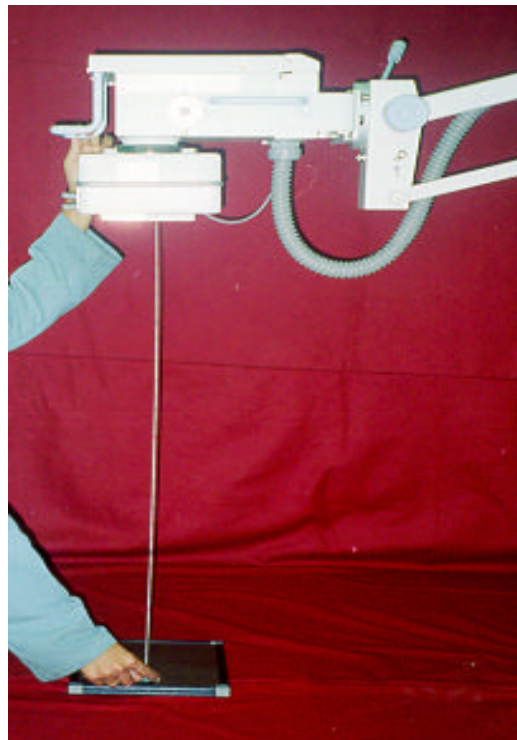
Using slide flaps set a format of 18 cm x 24 cm or 8"x 10".

Switch on the Collimator Lamp and align the cassette.

Attach radio-opaque markings to the cassette. Attach a washer as lateral marking. Trigger an exposure and develop the film .

Using a waterproof felt pen, write the following data on the developed film

- set SID
- film size
- radiation field size



8.8.2 Adjustment and Evaluation

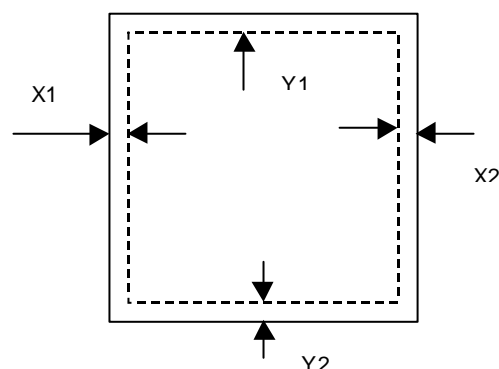
Measure the deviations between light field edges and radiation field edges on all four sides (X1,X2,Y1,Y2) as shown.

Determine the total deviations in the X and Y direction (ignore the +/- signs).

Both, length deviation (ΣY) and width deviation (ΣX) must be ≤ 2.0 cm.

If the deviation is higher, loosen the 4 screws. slightly and move the collimator accordingly as shown. Then tighten the screws at the collimator again.

Repeat the check and, if necessary, adjust the collimator again until the deviation between the light field and the radiation field is within the tolerance (≤ 2 cm).



The Adjustment can also be achieved with the help of a fluorescent screen.



8.9 Checking and readjusting the counterweight

Unlock the support arm and release the turning knob. Without any accessories attached, the support arm should be easy to move across the entire movement range and stop in any position. If the arm is not counterbalancing itself adjustments in the spring tension are required.

8.9.1 Movements

Check arm counterbalancing at all positions.

It should be easy to lift the arm UP or pull it down.

When the single tank does not remain at the required position, tighten the M10 nut on the bracket. If it still does not remain at the required position the spring tension should be adjusted for complete balancing. i.e. If the Single Tank moves DOWN from the required position, the spring tension is to be increased. If it moves UP, then the spring tension is to be reduced. Refer adjustment instructions.

8.9.2 Adjustment Instructions

Adjusting the balancing of the arm

Carry out the change in the pre-tension of the spring tension as explained below.

Remove the column cap from the column.

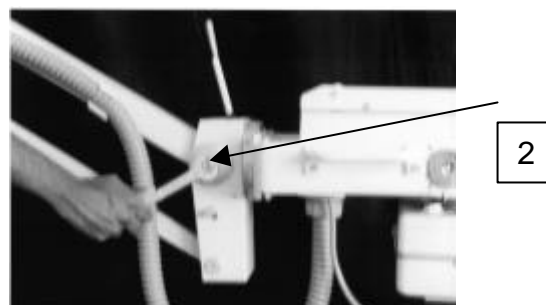
Fully release the supplementary brake on the support arm.

Move the support arm into the horizontal position. Release the M10 locknut using two 16/17 open end spanners.

If the Single Tank moves DOWN from the required position, firmly tighten the M10 nut shown in the picture 16/17 open-ended spanner. Set the spring tension so that the state of equilibrium is obtained when the support arm is in the horizontal position, i.e. that the raising and lowering forces of the tube assembly are the same. If it moves UP, loosen the M10 nut. Check the balancing and then tighten the locknut.



8.9.2.1 Adjusting the friction in the arm



Turn the clamping knob (1) to loosen the friction in the arm system. After adjusting the position of the arm the clamping knob should be tightened. Tighten the nut (2) shown periodically using 16/17 Spanner.

In case of balancing problem contact Siemens Customer Service.

8.10 Removing the top panel , front cover and X-ray source assembly

8.10.1 Removing the top panel

Turn off the Multimobil 2.5, disconnect the mains chord and wind the cord around the cable holder.

Lower the X-ray source assembly to transport position. Lock the Multimobil 2.5 by applying the brake.

Unscrew the two ornamental screws with 2.5 mm allen key.

Grasp the top panel and lift it (as shown in figure).



8.10.2 Removing the Front cover.



Turn off the Multimobil 2.5, disconnect the mains chord and wind the cord around the cable holder.

Lower the X-ray source assembly to transport position. Lock the Multimobil 2.5 by applying the brake.

Arrange some kind of soft bedding to place the front cover on .

Unscrew the four ornamental screws with 2.5mm allen key.

Grasp the cassette box and slowly pull it outside.

Position the front cover on a soft bedding.

8.10.3 Removing the X-ray source assembly.



Turn off the Multimobil 2.5, disconnect the mains chord and wind the cord around the cable holder.

Lower the X-ray source assembly to transport position. Lock the movement of the Multimobil 2.5 by applying the foot brake.

Make sure that the X-ray source assembly is properly secured with the transport safety lock. It should not be possible to move the X-ray source assembly upwards. This is very important for safety reasons.

Tighten the clamping knob.

Rotate the X-ray source assembly so that the collimator points towards the floor.

Loosen the two hexagonal head bolts with a 16-17 open end spanner three to four turns for each screw.

Loosen the two screws (two to three turns) mounted on the mounting plate- outer assembly.

Grab the handles and remove the X-ray source assembly. Place it on a soft bedding with collimator facing upwards.



Do not attach anything other than the X-ray source assembly to the arm system.

Other objects will disengage the transport safety lock, causing the arm system to move unanticipated which can cause both personal injury and damage to the equipment.

8.11 Replacing the single tank

To replace the single tank, remove it from the mobile stand as follows:

Move the arm system in the lowest (parking) position and check if the safety locking has engaged.

The arm cannot be moved upwards any longer.

Tighten the supplementary lock turning the knob.

Remove the single tank cover.

Disconnect the Single Tank connections from Control by removing snap-on connections and the earth connection.

Loosen the two M10 Hex bolts on the mounting plate assembly using 16/17 spanner.

Lift the single tank off vertically and place it on a soft base.

Detach the collimator

Install the new single tank in the reverse order mentioned above.

Check alignment of light field to radiation field and adjust if necessary .

CAUTION

The parameter adjustments and the calibration of the Unit is Specific to the Single Tank. In case if the Single Tank is replaced **it is necessary to recalibrate the equipment.**

8.12 Replacing the collimator

In case of any damage to collimator housing, the collimator has to be replaced completely.

Proceed as described in the following

Loosen the allied connector on the collimator cable and disconnect it.

Remove the collimator after loosening the four screws .

Attach the new collimator, fasten it with the four screws & follow the light field and radiation field alignment procedure.
Connect the connecting cable.

Check coincidence of light and radiation field and make adjustment if required

8.13 Replacing the Collimator lamp



Loosen the screw of the clamp which has marked for light indication on the collimator. take out the defective lamp and replace it by a new lamp.

CAUTION

Do not touch the glass envelope with your bare fingers.

Screw down the bracket and the front panel. Check the function of the lamp.